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Does Retrospective Thought Measurement  
Influence Subsequent Measures of Cognitive  
Structure in an Advertising Context?

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## ABSTRACT

A simple model is proposed to account for reactive effects due to retrospective thought measurements on subsequent measures of cognitive structure in an advertising context. Some of the predictions derived from the model are then tested in a laboratory experiment on advertising effectiveness. The findings are consistent with the model predictions, and suggest that thought measurement inflates subsequent measures of brand name recall, and confidence in and strength of association among belief, attitude, and intention measures--and particularly so when audiences adopt a brand evaluation (rather than an ad evaluation) goal during the initial ad-viewing episode. Implications of these findings for future persuasion research utilizing the thought measurement methodology are discussed.



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Over the last decade or so, persuasion researchers have become increasingly interested in the cognitive processes that presumably mediate communication effects on cognitive structure variables. This interest is evidenced by the current popularity of the cognitive response approach which specifies that the spontaneous thoughts or cognitive responses experienced during message exposure are the key mediators of message effects on beliefs and attitudes about the message topic (Greenwald 1968; Wright 1973, 1980; Olson, Toy and Dover 1978, 1982; Petty, Ostrom and Brock 1981; Lutz and Swasy 1977). Cognitive responses are usually measured by asking subjects to verbalize or write down the thoughts they had as they viewed the persuasive message. These thought verbalization data have been used to test increasingly detailed theories and hypotheses about mass persuasion phenomena such as low involvement advertising effects (Petty and Cacioppo 1981, 1984; Petty, Cacioppo and Schuman 1983; Batra and Ray 1983; Gardner, Mitchell and Russo 1982; Chaiken 1980), mediators of source versus message characteristics on attitude (Petty and Cacioppo 1981, 1984; Petty, Cacioppo and Schuman 1983; Sternthal, Dholakia and Leavitt 1978), effects of distraction on yielding (Petty, Wells, and Brock 1976), and mediators of attitude towards the advertisement (MacKenzie and Lutz 1982; Lutz, MacKenzie and Belch 1983; Batra and Ray 1983; Mitchell, Russo, and Gardner 1985). This incomplete list of applications illustrates the great interest in thought verbalization data among persuasion and advertising researchers.

Given the increasing use of verbal reports as data in persuasion research, it is important to establish that the procedures used to elicit these verbal reports are non-reactive, i.e., they do not influence subsequent measures of brand-related cognitive structure such as recall of brand name and ad content and/or beliefs, attitudes, and intentions about the advertised brand. If the act of thought listing/verbalization influences one or more of these persuasion-related dependent variables, then the validity of tests for experimental effects

on those variables has clearly been compromised. Despite the importance of this "reactivity" issue, relatively few studies in the social psychology literature (and none in marketing) have examined the effects of taking thought measurements on subsequent measures of cognitive structure about the advocacy issue (Petty and Cacioppo 1977; Insko, Turnbull and Yandell 1974; Petty, Wells and Brock 1976). Even in these studies, the approach was essentially atheoretical. No reasons for expecting reactive effects due to the thought listing/verbalization task were offered, and nor was any attempt made to identify the mechanisms or processes that might mediate such effects. Instead, thought measurement was manipulated as a between subjects factor (i.e., some subjects listed their thoughts before they reported their attitude, while others did not), and all possible (main and interactive) effects due to thought measurement on post-exposure attitude were assessed. In all three studies, thought measurement failed to influence subsequent measures of attitude. These results are frequently cited as evidence that the thought listing/verbalization procedures are non-reactive (Cacioppo, Harkins and Petty 1981; Cacioppo and Petty 1981). However, the absence of a theoretical framework limits the generalizability of these findings to other dependent variables, stimuli, and settings. In particular, several questions remain unresolved. For instance, does the failure to find significant effects on attitude mean that other indicators of cognitive structure such as beliefs and intentions or recall of brand name and ad content will also not be affected by thought measurement? Will the reactive effects due to thought measurement change if the persuasive message is a novel advertisement about an unfamiliar brand rather than the more typical "listing of arguments" in favor of a counterattitudinal issue used in social psychology studies? Will situational factors such as processing goals or individual difference variables such as involvement and product familiarity moderate the

magnitude of reactive effects due to thought measurement? Clearly, these questions cannot be answered on the basis of post-hoc empirical analyses alone.

In this paper, we examine the effects of thought measurement on subsequent measures of several cognitive structure variables of interest to persuasion researchers. First, we introduce a simple theoretical framework that (a) specifies the cognitive structure variables that are likely to be affected by thought measurement, (b) identifies the mechanisms or processes that mediate these effects, and (c) predicts the conditions under which these reactive effects are likely to be large. Hypotheses generated from the framework are then tested using data from an experiment. The paper concludes with a discussion of the results and their implications for future persuasion research using verbal reports as data.

#### THEORETICAL FRAMEWORK

In most persuasion research, thought measurements are obtained by the method of retrospective thought listing or verbalization. The procedures used to obtain retrospective verbal reports have become fairly standardized (e.g., Olson, Toy and Dover 1982). Immediately after exposure to a persuasive message (e.g., an advertisement), subjects are asked to verbally state or write down all the thoughts that occurred to them as they viewed the message/advertisement. Subjects are given a fixed period of time (usually 2-4 minutes) for thought listing. Measures of persuasive impact (such as beliefs and attitudes) and memorability (such as recall/recognition) are then usually obtained.

Cognitive response theory holds that the recipient of an advertisement generates spontaneous cognitive responses or thoughts as he/she attempts to comprehend and evaluate the advertising message. The type of cognitive responses generated depend on the goals of the receiver. For the moment, we assume that the receiver is interested in forming an evaluation of the



advertised brand. This assumption is relaxed in a subsequent section when we examine the effects of processing goals on the reactivity of thought measurement. If a brand evaluation goal is adopted, the receiver will predominantly produce counter and support arguments, i.e., pro/con thoughts directed at the advertised brand or at specific assertions/claims about the brand made in the advertisement. These cognitive responses are presumed to be the causal determinants of post-exposure beliefs, attitudes, and intentions about the advertised brand (Wright 1973, 1980; Olson, Toy, and Dover 1982). Thus, the cognitive responses are likely stored in long term memory in close proximity to the brand name and some of the advertising claims that triggered these responses, as well as the newly formed (or changed) beliefs, attitudes, and intentions about the brand (Wright 1980; Mitchell 1983; Beattie and Mitchell 1985).

When confronted with an unexpected thought reporting task, subjects attempt to retrieve their cognitive responses from memory. Some of these cognitive responses are still available in STM and can be readily reported. However, a majority of the cognitive responses are unavailable in STM, and must be searched for and retrieved from LTM (Ericsson and Simon 1980; Wright 1980). Retrieval of information from LTM is best explained by the spreading activation theory of semantic processing (Collins and Loftus 1975). As the subject attempts to retrieve his cognitive responses, one or more cognitive response nodes in memory are initially activated. Activation then spreads to other neighboring concept nodes, i.e., to other cognitive responses as well as some of the beliefs, attitudes/intentions, and message assertions that are stored in memory in close proximity to the cognitive responses. Note that this spread of activation in the LTM associative network is at least partly automatic and outside the conscious control of the subject (Collins and Loftus 1975; Anderson 1980). In other words, even though the subjects may be concentrating their attention on the task of retrieving and reporting their prior

cognitive responses, some of the other brand-related concepts that are linked to these cognitive responses will be activated. The activated concepts enter STM and are available for thought/listing verbalization. Subjects must examine these activated concepts and identify those concepts that reflect their prior thoughts before producing a verbal or written report of their thoughts.

In sum, we have conceptualized the retrospective thought listing/verbalization task as a two stage process--a search/retrieval stage and a reporting stage. During the retrieval stage, subjects search for their prior cognitive responses in LTM via the spreading activation search process. Other brand-related concepts in LTM are also activated during this search. All activated concepts are then processed in STM during the thought reporting stage. Each of these processing stages can affect one or more post-exposure dependent measures that are of interest to persuasion researchers. We now explore the nature of these effects.

#### Implications of the Spreading Activation Search Process

One consequence of the search for cognitive responses in LTM is that brand name and some of the ad statements/claims that are stored in close proximity to the cognitive responses will also be activated. These activated concepts should be more easily retrievable in a subsequent memory task. There is evidence in the verbal learning literature to show that activating a concept in memory during an initial (unrelated) task increases the likelihood and speed with which that concept is later recalled (e.g., Meyer and Schvaneveld 1971). Thus, thought measurement should increase recall of brand name and ad content. Unfortunately, ad content recall was not measured in our study, so brand name recall data were used to test this prediction.

The search process also activates beliefs, attitudes, and intentions, and primes the pathways or arcs connecting these concepts in LTM. This means that

these cognitive structure variables are more strongly interconnected following search. The increased interconnectedness or cohesiveness in cognitive structure should be reflected in two measures that are of interest to persuasion researchers. First, the increased cohesiveness should increase the strength of association among beliefs and attitude/intention measures. Second, the increased cohesiveness should increase the confidence or certainty with which beliefs, attitudes, and intentions are held in memory. Indirect support for these predictions comes from a study by Olson and Dover (1978) in which repeated activations of beliefs, attitudes and intentions towards an advertised brand lead to stronger correlations among, and greater confidence in these variables.

In sum, we expect the spreading activation search process to mediate thought measurement effects on three distinct dependent variables that are of interest to (and frequently measured by) persuasion researchers. Specifically, thought measurement should increase (a) recall of brand name, (b) strength of association among beliefs and attitude/intention measures, and (c) confidence in belief, attitude, and intention variables.

Moderating Influence of Processing Goals. The predictions we have derived thus far are based on the assumption that audience members adopt a brand evaluation goal when they initially view and process the product advertisements. However, audience members who are uninvolved with the advertised product category may not be interested in engaging in brand evaluation processes (Mitchell 1983). Instead, uninvolved audiences may adopt one of several non-brand evaluation goals such as enjoying and being entertained by the advertisement (entertainment goal) or evaluating the advertisement on its executional merits (ad evaluation goal; see Mitchell 1979, 1980, 1983; Mitchell and Olson 1981; Gardner, Mitchell and Russo 1985; Gardner 1985; Beattie and Mitchell 1985 for additional discussion on processing goals). Such audiences will generate few



(if any) cognitive responses about the advertised brand, and are not likely to form brand-related beliefs and attitudes during the ad-viewing episode. Instead, audiences with an entertainment or ad evaluation goal will likely generate pro/con thoughts targeted at the advertisement itself, and develop overall evaluations of the advertisement (i.e., attitude towards the ad). Consequently, the search for cognitive responses during the retrieval stage should activate few (if any) message assertions, or belief/attitude/intention variables about the advertised brand. Thus, thought measurement should result in weaker effects on the recall of brand name/ad content, as well as confidence in and strength of association among beliefs, attitude, and intention elements for audiences who adopt a non-brand evaluation goal.

The hypothesized moderating influence of processing goals on the magnitude of reactive effects due to thought measurement should be of interest to advertising researchers and practitioners since commercial message audiences are likely to adopt a variety of processing goals in natural viewing situations. In our study, we manipulated processing goals at two levels--brand evaluation and ad evaluation--to test the following related hypotheses:

- H1: Brand name recall will be higher following thought measurement. Furthermore, the effects due to thought measurement on brand name recall will be stronger under a brand evaluation goal than under an ad evaluation goal.
- H2: Strength of association among belief and attitude/intention measures will be higher following thought measurement. Furthermore, the effects due to thought measurement on these strength of association measures will be stronger under a brand evaluation goal than under an ad evaluation goal.
- H3: Confidence in belief, attitude, and intention variables will be higher following thought measurement. Furthermore, the effects due to thought measurement on confidence will be stronger under a brand evaluation goal than under an ad evaluation goal.

## Elaborative Processing of Activated Concepts During Thought Reporting

Thus far we have made no predictions about the effects of thought measurement on beliefs and attitudes about the advertised brand. Simply activating these cognitive structure elements during search will not induce changes in their intensity or evaluative directionality. Changes in beliefs and attitudes, if they occur, must occur at the thought reporting stage. Note that the subjects' primary task at this stage is to identify and report their previously experienced cognitive responses. However, if this thought reporting task is not too demanding (i.e., if it does not take up most of STM processing capacity), then subjects may also choose to additionally process and elaborate upon some of the message assertions and beliefs/attitudes that were activated during the search process. Such elaborative processing will result in new cognitive responses which, in turn, will induce changes in beliefs and attitudes about the brand.

Note that only if a brand evaluation goal was salient during the ad-viewing episode will message assertions as well as beliefs and attitudes about the brand be activated during search and hence available in STM for elaborative processing. However, simply because these brand-related concepts are activated does not mean that subjects will think about and elaborate on these concepts during the thought reporting task. For elaborative processing to occur, subjects must have both the opportunity and the motivation to engage in such processing activity. The opportunity factor will primarily depend on the amount of time given to subjects for thought reporting. If stringent limits are placed on reporting time, then subjects will have sufficient time to report their previously experienced cognitive responses, but minimal opportunity for generating new cognitive responses from scratch via elaborative processing (Wright 1980). However, if reporting time is excessive or unconstrained, then elaborative processing is at least a possibility. Indirect support for this

proposition comes from research concerning the effects of thought on attitude which suggests that simply giving subjects an opportunity to think about stimulus material after exposure tends to polarize beliefs and attitudes about that material, and increasing the time (and hence opportunity) for thought tends to increase polarization likelihood (Tesser 1976; Tesser and Conlee 1975; Tesser and Cowan 1977; Tesser and Leone 1977; Sadler and Tesser 1973).

Subjects' motivation to elaborate will depend on factors such as previous experiences with the advertising message and involvement with the advertised brand. For instance, repeated exposures to an advertisement provide subjects with multiple opportunities to process ad content and should thus result in a detailed, well formed belief structure. A detailed belief structure can also result from a single exposure if the advertised brand is highly involving and motivates subjects into detailed, elaborative processing during the ad-viewing episode. Consequently, the need for (and hence motivation to) engage in additional thought processing during the reporting task should be quite low. In contrast, a single limited time exposure to an unfamiliar advertisement is unlikely to produce a detailed and well-formed belief structure--and especially so for an uninvolved brand where subjects are not sufficiently motivated to engage in detailed message processing. In particular, there might be residual inconsistencies within the belief structure or between the beliefs and attitudes/intentions. Furthermore, some of the beliefs may be based on incomplete and/or incorrect assessment of the message claims. Thus, subjects may be particularly motivated to engage in elaborative processes such as inferring new beliefs or modifying some of the existing beliefs during a subsequent thought measurement task. Changes in the belief structure would induce a revision of attitudes and intentions as well.

Earlier, we described three studies in the social psychology literature that failed to obtain significant effects due to thought measurement on



subsequent measures of attitude (Petty and Cacioppo 1977; Insko, Turnbull and Yandell 1974; Petty, Wells and Brock 1976). These findings can readily be explained within our theoretical framework. All three of the studies used persuasive messages on highly involving topics (e.g., tuition hike for undergraduate students in Petty, Wells and Brock 1976). Furthermore, two of the three studies imposed a time limit of 2½ minutes for the thought reporting task (Insko, Turnbull and Yandell did not report on this issue at all). Thus, subjects likely did not have either the motivation or the opportunity to engage in elaborative processing during thought measurement--thus precluding strong measurement effects on post-attitude scores. Our framework suggests, however, that these results will not hold in persuasion contexts where subjects are uninvolved with the message and the amount of time given subjects for thought listing is high or unlimited.

One goal of the present research was to examine thought measurement effects on subsequent measures of cognitive structure using stimuli and measurement procedures similar to those used in previous advertising studies. Most cognitive response studies in the consumer behavior literature have used novel advertisements about unfamiliar and relatively uninvolved products as the experimental stimuli--thus heightening subjects' motivation to engage in elaborative processing during thought measurement. However, following the advice of Wright (1980), consumer researchers have begun to impose stringent limits on the amount of time given to subjects for thought listing/verbalization. Limited thought reporting time should minimize the opportunity for elaborative processing. Thus, we would expect relatively weak (if any) effects due to thought measurement on subsequent measures of belief, attitude, and intention variables. This proposition was tested in the present study:

- H4: If stringent time limits are placed on the thought measurement task, then thought measurement will not influence subsequent measures of belief, attitude, and intention variables.

## Summary

A simple framework based on information processing theory was proposed to examine the effects of retrospective thought measurement on subsequent measures of cognitive structure about an advertised brand. (A flow chart representation of the framework is displayed in Figure A.) Specifically, the retrospective thought listing task was conceptualized as a two stage process, with each processing stage (search/retrieval stage and reporting stage) producing effects on different aspects of post-exposure cognitive structure. This framework was used to develop several predictions about the dependent variables that are likely to be effected by thought measurement, and the conditions under which these effects are strong or weak. We now report on an experiment designed to test some of these predictions.

## METHOD

### Study Overview

Subjects were exposed to print advertisements for fictitious brands (named Banner and Sprint) of two commonly used consumer products, white bread and ball point pen. The advertisements were created especially for this study and had not been seen before. Immediately after exposure, subjects listed their thoughts in response to one of the two product ads, and then provided several measures of post-exposure cognitive structure.

### Subjects and Design

One hundred and sixty-five subjects participated in the study. Of these, 160 provided usable responses. A four-way ( $2 \times 2 \times 2 \times 2$ ) factorial design was employed separately for each one of the two products ( $n=10$  per cell). Only two of these factors--processing goals (brand versus ad evaluation), and thought measurement (for the bread ad or the pen ad)--are of theoretical interest. Although the other two factors--ad message quality (strong versus weak)

and order of belief and attitude measurement (beliefs measured before attitude or vice versa)--were retained in all analyses, these are not of interest in the present study and hence only briefly discussed.

Processing Goals. Two levels of Processing Goals--a brand evaluation goal and an ad evaluation goal--were created via orienting instructions. Each study participant was given these instructions just before (s)he viewed the print advertisements. Subjects assigned to the brand evaluation goal condition were told that the purpose of the study was to develop an understanding of how people evaluate products based on the information in advertisements. They were asked to examine the information in each advertisement and decide whether they liked the advertised brand and if they would be interested in purchasing it. Subjects assigned to the ad evaluation goal condition were told that the purpose of the study was to develop an understanding of how people evaluate print advertisements. They were asked to examine each advertisement carefully and to decide whether they liked the ad, and if it was the kind of ad that would attract and hold their attention.

Thought Measurement. All subjects were exposed to two experimental ads (one each for Banner bread and Sprint pen), provided verbal reports for only one of the two product ads, and provided measures of post-exposure cognitive structure for both products. Thus all subjects in the "thought measurement" condition for Banner bread also served as the "no thought measurement" condition for Sprint pen, and vice versa.

Message Quality. Four color print advertisements--two each for Banner bread and Sprint pen were created by a professional artist. All of these advertisements had a similar layout. The upper half of the page contained a picture of the advertised brand and a very general headline above it in bold letters. The lower half of the page contained the persuasive arguments. For Banner bread, the first copy statement in both versions of the advertisement



said, "Banner is one of the most nutritious white breads on the market today. Here's why..." Then, one version provided three relatively compelling reasons for accepting this claim about nutritional quality (strong quality message), whereas, the second version provided three relatively unconvincing reasons for claim acceptance (weak quality message). Similarly, the Sprint pen advertisement emphasized the properties of ink flow consistency and smooth writing with the opening sentence, "Consistent ink flow and smooth writing are what you want from a ball point pen." This claim was followed by either three compelling or three unconvincing reasons for claim acceptance.

Order of Measurement. The order in which beliefs and attitudes/intentions towards the advertised brand were measured was counterbalanced, and served as a between subjects factor.

#### Procedure

The study was conducted in 29 experimental sessions with groups of 2-8 subjects per session. Upon arrival, subjects were given a one-page set of orienting instructions designed to manipulate their processing goals (Brand versus Ad Evaluation). Then, all subjects were shown five advertisements--the two experimental ads (strong or weak quality versions) and three "control" ads that were similar in structure and layout as the experimental ads. These advertisements were projected onto a screen via a slide projector for 45 seconds each. This time limit was judged appropriate based on pre-test data. The two ads for Banner bread and Sprint pen were rotated in positions 2 and 4 of the ad-viewing sequence such that exactly half the subjects saw each ad in each position.

After the fourth ad (or second experimental ad), the ad-viewing session was interrupted without warning, and cognitive responses were obtained for the fourth ad only. This ad happened to be for Banner bread for half the subjects

and for Sprint pen for the other half. Subjects were given exactly three minutes to list all the thoughts they had while viewing the ad. The three-minute time limit was judged adequate based on pre-test data.<sup>1</sup>

After the subjects had viewed all five ads, they completed the rest of the study questionnaire, which was designed to measure post-exposure cognitive structure for both experimental products. Subjects were then debriefed, paid five dollars, and thanked for their participation.

### Dependent Variables

Recall. Immediately after viewing the five advertisements, subjects completed a 3-5 minute intervening task to clear working memory, and then free-recalled the advertised brands.

Belief Strength and Attribute Evaluation Measures. A modification of Ahtola's (1975) procedure was used to measure belief strength and attribute evaluation. The modification was developed by Mitchell and Olson (1981) and is explained in detail in their paper. This approach requires that measurement be done for discriminable attribute levels, rather than for the attributes themselves. As an example, the attribute of nutritional quality for white bread was partitioned into three levels--more nutritious, about as nutritious, and less nutritious than most other white breads. Then, subjects rated their belief strength ( $b_{ij}$ ) for each attribute ( $i$ ) for each level ( $j$ ) on a seven-point bipolar scale (not at all likely-very likely). A seven-point scale (good-bad) was used to measure the corresponding evaluation ( $e_{ij}$ ) for each attribute level.<sup>2</sup>

Brand Evaluation and Purchase Intention Measures. Multiple seven-point scales were used to measure brand attitude ( $A_{br}$ ) and attitude towards the act of brand purchase ( $A_{act}$ ).  $A_{br}$  was measured using three scales (good-bad, high quality-poor quality, like-dislike),  $A_{act}$  using four scales (good-bad, beneficial

harmful, wise-foolish, pleasant-unpleasant). The reliability of these scales as measured by coefficient  $\alpha$  was greater than 0.90 for both constructs. Consequently, the mean of the evaluative scales for each construct was taken as the operational measure for that construct. Intention to purchase the brand (BI) was measured using a single seven-point scale (not at all likely-very likely).

Confidence Measures. Confidence in beliefs ( $b_{ij}$ ) as well as  $A_{br}$ ,  $A_{act}$ , and BI were all measured by seven-point scales (1 = not at all confident, 7 = very confident).

## RESULTS

### Manipulation Checks

The manipulation of processing goals was checked in two ways. First, we had subjects agree or disagree (on a seven-point scale, with 7 = strongly agree) with two statements describing how they processed the print advertisements:

(1) I was mainly thinking about whether the product would be suitable for me.

(2) I was mainly thinking about whether or not I liked the advertisement.

As expected, subjects assigned to the brand evaluation goal agreed more with statement 1 (Mean  $M = 5.86$  for bread,  $6.06$  for pen) than did subjects assigned to the ad evaluation goal ( $M = 3.09$  for bread,  $3.54$  for pen). Conversely, ad evaluation goal subjects agreed more with statement 2 ( $M = 6.25$  for bread,  $6.19$  for pen) than did brand evaluation goal subjects ( $M = 3.94$  for bread,  $3.89$  for pen). All differences were significant at  $p < .01$ .

As a second check, we examined the effect of Processing Goals on the number of brand versus ad-related thoughts reported by subjects. As expected, subjects assigned to the brand evaluation goal reported more brand-related thoughts ( $M = 2.55$  for bread,  $3.33$  for pen) than did subjects assigned to the

ad evaluation goal ( $M = 0.55$  for bread,  $0.50$  for pen). Conversely, ad evaluation goal subjects reported more ad-related thoughts ( $M = 4.40$  for bread,  $4.30$  for pen) than did brand evaluation goal ( $M = 3.03$  for bread,  $2.33$  for pen). These results clearly suggest that the processing goals manipulation was successful in either encouraging or distracting subjects from thinking about the advertised brand and its properties.

#### Thought Measurement Effects Mediated by the Search Process

The spreading activation search process is expected to mediate effects due to thought measurement on three persuasion-related variables--brand name recall, strength of association among beliefs and attitude/intention measures and confidence in beliefs and attitude/intention variables (hypotheses 1 through 3).

Brand Name Recall. Table 1 shows the number of subjects who correctly recalled the brand names (Banner and Sprint) for the two experimental products at different levels of the processing goals and thought measurement factors. Note first that thought measurement consistently led to higher recall frequency for both products ( $\chi^2 = 10.32$  for bread,  $9.23$  for pen, both  $p < .01$ ). Furthermore, thought measurement led to higher recall only under a brand evaluation goal ( $\chi^2 = 10.77$  for bread,  $8.35$  for pen, both  $p < .01$ ), and not under an ad evaluation goal ( $\chi^2 = 1.33$  for bread,  $2.52$  for pen, both  $p > .10$ ). These results clearly support H1.

#### Strength of Association Between Beliefs and Attitude/Intention Measures.

According to H2, thought measurement is expected to increase the strength of association between beliefs and attitude/intention measures, and particularly so for subjects assigned to the brand evaluation goal condition. Table 2 shows the correlations between the expectancy-value index of beliefs ( $\sum \sum b_{ij} e_{ij}$ ) and  $A_{br}$ ,  $A_{act}$  and BI scores computed separately for the "thought measurement"



and "no thought measurement" conditions. Each correlation is based on 80 observations. These correlations exhibit the expected pattern of results for both products, and especially so for Banner bread where two of the correlations ( $\sum \sum b_{ij} e_{ij} - A_{act}$  and  $\sum \sum b_{ij} e_{ij} - BI$ ) were significantly higher following thought measurement than the corresponding correlations in the absence of thought measurement (see Table 2).

Table 3 also shows the correlations between the expectancy value index ( $\sum \sum b_{ij} e_{ij}$ ) and  $A_{br}$ ,  $A_{act}$  and BI, but these have been computed separately for each of the four cells of the Thought Measurement by Processing Goals sub-design (40 observations per cell). The pattern of correlations for Banner bread is clearly consistent with prior expectations--thought measurement led to significantly larger correlations for subjects with a brand evaluation goal, but had virtually no effect on subjects with an ad evaluation goal. For Sprint pen, thought measurement seems to have resulted in marginally larger correlations independent of the processing goals factor. However, the differences in these correlations were quite small and not statistically significant ( $p > .10$ ). Thus H2 is supported in the analyses for Banner bread data, but not for the Sprint pen data analyses.

Confidence Scores. The effects of thought measurement on confidence in belief, attitude and intention variables were examined in several four-way ANOVA separately for the two products. Of primary interest here is the main effect due to Thought Measurement, and the two-way interaction between Thought Measurement and Processing Goals. Specifically, thought measurement should increase confidence, and this effect should occur primarily for subjects with a brand evaluation goal.

Table 4 displays the marginal means for confidence in  $A_{br}$ ,  $A_{act}$ , and BI at different levels of the thought measurement and processing goals factors. Also, F-ratios and significance levels for the two effects of theoretical

interest are displayed. As expected, thought measurement led to significantly higher confidence in all three variables for both products. However, the hypothesized two-way interaction did not reach significance for any of the three variables for either product. Virtually none of the other interaction effects involving the thought verbalization factor reached significance. These results are only partially consistent with hypothesis H3.

Confidence in beliefs was measured at the discriminable belief level. Seventeen confidence ratings were obtained for the seven salient beliefs for Banner bread. Similarly, the eight salient Sprint pen beliefs yielded 18 confidence ratings. Table 4 shows the marginal means for the average of these belief confidence scores. As expected, average confidence in beliefs was significantly higher following thought measurement. Furthermore, the hypothesized two-way interaction also reached significance for both products--thought measurement produced larger effects on the average confidence in beliefs under a brand evaluation goal than under an ad evaluation goal. The analyses for confidence in individual beliefs mimicked these results. Thought verbalization produced at least a marginally significant ( $p < .10$ ) main effect on six of 17 confidence scores for Banner bread, and eight of 18 confidence scores for Sprint pen. (At  $p < .05$ , the corresponding numbers were 4/17 and 7/18 respectively.) Furthermore, the hypothesized thought verbalization by processing strategy interaction approached significance ( $p < .10$ ) in five of 17 cases for Banner bread, and eight of 18 cases for Spring pen. (At  $p < .05$ , the corresponding numbers were 3/17 and 6/18 respectively). In almost all cases, the marginal treatment means displayed the same pattern as the average belief confidence score (see Table 4). Very few other interaction effects involving the thought verbalization factor reached significance, and these were scattered and uninteresting. These results clearly support H3.



### Thought Measurement Effects Mediated by Elaborative Processing

Thought measurement can bias subsequent measures of belief structure as well as attitudes and intentions towards the advertised brand--but only if subjects have both the motivation and the opportunity to engage in elaborative processing during the thought reporting stage. In the present study, subjects' opportunity to engage in elaborative processing was severely curtailed by limiting the amount of time they had for reporting their thoughts. Therefore, we did not expect to find significant effects due to Thought Measurement on subsequent belief, attitude, and intention measures (H4).

Our analyses substantiated this prediction. In separate four-way ANOVA, thought measurement failed to produce a significant main effect on any of four indices of brand evaluation ( $\Sigma b_{ij} e_{ij}$ ,  $A_{br}$ ,  $A_{act}$ , BI) for either product ( $p > .10$  in all cases). More generally, virtually none of the main or interactive effects involving the thought measurement factor were significant. For instance, only one out of 32 possible effects were significant for Banner bread, while none of the 32 possible effects were significant for Sprint pen at  $p < .05$ . The analyses for individual belief scores produced similar results. Thought Measurement failed to produce significant effects on any of the seven salient beliefs for Banner bread or for any of the eight salient beliefs for Sprint pen ( $p > .05$  in all cases). When all possible effects due to the thought measurement factor were examined, only three of 56 were significant for Banner bread, and 3 of 64 were significant for Sprint pen at  $p < .05$ . Since these results could readily be attributed to chance factors, it appears that thought measurement did not induce any changes in post-exposure measures of beliefs, attitudes, and intentions in the present study.

## DISCUSSION

Much has been said (and some empirical work done) concerning the reactive effects due to retrospective thought measurement in persuasion research. However, little is currently understood about the mechanisms or mental processes that mediate thought measurement effects on post-exposure cognitive structure, or about the conditions under which these effects are likely to be strong. In this paper, a simple two-stage model of the retrospective thought listing task was proposed. Some of the predictions derived from this model were then tested in a laboratory experiment on advertising effects. The intent was to examine reactive effects due to thought measurement in a study utilizing stimuli and measurement procedures similar to those typically used in advertising research on cognitive response mediation. Overall, the results were quite consistent with model predictions.

### Summary of Findings

Our findings clearly suggest that thought measurement activates other "related" cognitions that are stored in LTM in close proximity to the "to-be-reported" thoughts. This proposition was supported in analyses involving three distinct dependent variables. Thought measurement consistently lead to (a) higher brand name recall, (b) greater confidence in belief, attitude, and intention variables, and (c) stronger correlations between the expectancy-value index of beliefs and attitude/intention measures (although only for one of the two products). Thus, the spreading-activation search process appears to introduce a bias in post-exposure cognitive structure by making it more interconnected, more cohesive, and more easily retrievable in a subsequent memory task.

We introduced the manipulation of processing goals in an attempt to develop even stronger tests of the "spreading-activation" proposition. This variable was chosen because a number of persuasion and advertising researchers

have become interested in the effects of processing goals on cognitive response mediation processes (e.g., Mitchell 1983; Batra and Ray 1983; Gardner 1985). The hypothesized Processing Goals by Thought Measurement interaction was supported in analyses for brand name recall, and received partial support in analyses involving confidence scores (for beliefs, but not attitude or intentions) and correlations between beliefs and attitudes/intentions (for white bread data only). These findings provide some (but not unambiguous) support for the expectation that reactive effects due to thought measurement are stronger following a brand evaluation goal, than following an ad evaluation goal.

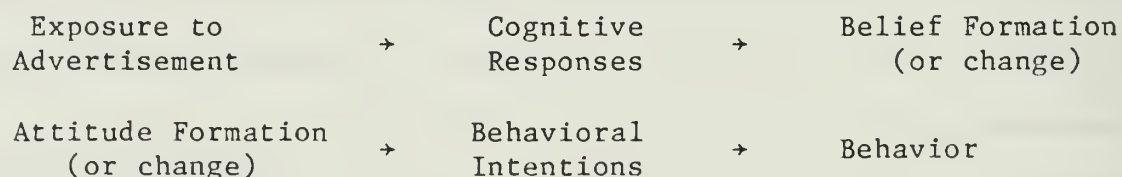
Finally, we also examined the effects of taking thought measurements on more traditional indicators of persuasive impact--beliefs, attitudes, and purchase intentions about the advertised product. Our model suggests that thought measurement will influence these variables only if subjects have both the opportunity as well as the motivation to engage in elaborative processing during the thought reporting stage. Given our interest in examining reactive effects due to thought measurement under conditions similar to those obtained in other advertising studies, we limited the opportunity for elaborative processing by imposing a three minute time limit on the thought reporting task. As expected, thought measurement failed to produce any detectable effects on belief, attitude, or intention variables under these conditions.

#### Implications for Cognitive Response Research

Most cognitive response researchers use verbal reports as data to test the mediating effects due to different cognitive response types (e.g., counterarguments and support arguments) directly on belief, attitude, and intention variables. A few empirical studies in social psychology have shown that retrospective thought measurements do not bias these tests of mediation

since they do not influence post-exposure attitudinal measures. Our results are consistent with these findings, and extend them to mediation analyses involving attributable beliefs and behavioral intentions as well. Furthermore, since the procedures used to obtain thought measurements in our study were very similar to those most frequently used in past cognitive response research, we believe that our findings do address some of the concerns about the validity of previous tests of cognitive response mediation.

More recently, however, researchers have begun to postulate more strict causal orderings among the cognitive structure variables. For example, the cognitive response-cognitive structure (CR-CS) model (Lutz and Swasy 1977; Olson, Toy, and Dover 1978, 1982) posits the following causal flow:



A test of this strict mediational chain is yet to be reported in the literature. However, taking thought measurements would likely bias such a test by inflating the observed strength of relationship between beliefs, and attitude/intention variables.

More generally, the increased cohesiveness and confidence in the cognitive structure instilled by thought measurement should influence the predictive potential of expectancy-value models of attitude and behavior. The importance of confidence as a moderator of belief-attitude and attitude-behavior relationships is increasingly being recognized. For instance, Smith and Swinyard (1982) have proposed that exposure to advertising typically produces beliefs that are held with a low level of confidence, and hence are only weakly predictive of attitude and overt behavior. They suggest that direct experience with the product is likely to increase the confidence in beliefs, and hence enhance



their prediction potential. Olson and Dover (1978) have shown that even repeated exposure to the same advertisement can increase confidence in beliefs (also see Dover and Olson 1977; Olson and Dover 1976). In their study, ad repetition (1, 2, or 3 exposures) produced no effects on beliefs and attitudes, but produced a consistent increase in the confidence in beliefs as well as in the belief-attitude correlation. In other words, repetition changed the nature and dynamics of the belief-attitude relationship without producing direct effects on these variables. Olson and Dover (1978) have labeled this phenomenon attitude maturation. Our results fit in nicely with the work by Smith and Swinyard (1982), and Olson and Dover (1978). They suggest that attitude maturation can occur even with a single exposure to an advertisement if subjects are given an opportunity to activate and think about their brand-related cognitions during a thought measurement task. Stated differently, thought measurement appears to produce similar (although admittedly weaker) effects on the cohesiveness and confidence in cognitive structure as do ad repetition and direct product experience.

The moderating influence of processing goals on thought measurement effects we obtained also has some important implications for cognitive response researchers. In most cognitive response studies, subjects are given extremely general orienting instructions--thus allowing them to decide for themselves as to how they should process the commercial messages (Wright 1980). One would expect such orienting instructions to result in considerable heterogeneity in the processing goals that subjects adopt during the ad-viewing episode. Since thought measurement is expected to interact with processing goals, variation in processing goals within experimental cells will only add to the error variance, and thus weaken tests of effects due to treatment manipulations on confidence or belief-attitude/intention correlation measures. Interestingly, the laboratory context (which is almost always used in cognitive response research) may

heighten subject's motivation levels and induce them to engage in brand evaluation processes. If so, then reactive effects due to thought measurement may be particularly strong in laboratory settings.

Finally, our results also suggests that thought measurement introduces bias in measures of brand name recall. Brand name and ad content recall are extremely popular indicators of advertising effectiveness, and routinely measured in copy testing research. Some cognitive response researchers have recently begun to examine the relationship between cognitive responses and recall. Our study shows, however, that interspersing a thought reporting task between ad exposure and recall measurement will lead to an inflated account of brand name (and ad content) memorability.

#### Future Research Directions

To our knowledge, this is the first empirical study to examine the effects of thought measurement on cognitive structure in an advertising context. Clearly, much more research is needed before we fully understand the nature and magnitude of effects due to thought measurement, as well as the causes for these effects. The conceptual model of the thought reporting process developed in this paper isolates some promising avenues for future research. Some of these are explored below.

Motivation and Opportunity to Elaborate. In our study, motivation and opportunity to engage in elaborative processing during the thought reporting stage were fixed at levels that commonly obtain in cognitive response studies (high motivation, low opportunity). Future research should more systematically examine the influence of these variables on the reactive effects due to thought measurement. The motivation factor could be varied by manipulating the number of exposures to an advertisement prior to thought reporting, by blocking on prior exposure to the experimental ads, or by blocking on prior



knowledge about, and involvement with the experimental products. Opportunity to elaborate can be varied by manipulating the amount of time available for thought reporting. Research in this area should provide insights into the conditions under which thought measurement is most likely to influence post-exposure belief and attitudinal measures.

General versus Directive Instructions. In our research, we instructed subjects to list all the thoughts they had while attending to the advertisement without regard to the origin or target of these thoughts. There is consensus in the literature that such "general" instructions are preferable to instructions that direct the subject to only report certain types of thoughts--typically thoughts targetted at the advertised brand (Wright 1980). A well publicized problem with directive instructions is that they are likely to bias and inflate thinking and reporting in favor of the targetted thought category. Nevertheless, the use of directive instructions continues to be popular (Cook 1969; Osterhouse and Brock 1970; Roberts and Maccoby 1973; Petty, Wells and Brock 1976).

Our research suggests an additional problem with directive instructions. By requiring subjects to report only those thoughts that were targetted at the advertised brand, the researcher is essentially encouraging activation and elaborative processing of brand-related cognitions in memory. Thus, directive instructions may lead to more substantial effects due to thought measurement than were obtained in our research.

Concurrent versus Retrospective Verbalization. We would also encourage future research on the relative effects due to concurrent versus retrospective thought measurement on cognitive structure. One crucial difference between the two procedures is that while retrospective measurement requires subjects to focus attention only on the thought reporting task, concurrent measurement requires subjects to view and process the message as well as to report their

thoughts. This suggests that concurrent verbalization should produce even weaker effects on cognitive structure (if at all) since very little processing capacity is left over for elaborative processing. Empirical research on this issue would provide valuable guidelines for persuasion researchers who are confronted with a choice between the two methods.

Dependent Variables. We examined thought measurement effects on several dependent variables in an attempt to generate convergent evidence for the hypothesized activation/elaborative processing mechanisms. In retrospect, it seems clear that several additional dependent measures could also have been used--particularly to indicate the spreading-activation process. The use of recall and recognition measures to indicate thought measurement effects would be particularly attractive since these measures are popular among advertising researchers and practitioners. We did show thought measurement effects on brand name recall, but demonstrating similar effects on recall of ad content would be even more compelling. Furthermore, increased accessibility of brand name and ad content due to spreading activation could also be indicated through response latencies for recognition probes. Specifically, recognition of brand name and message assertions should be speeded up following thought measurement because of their heightened accessibility in LTM. Thus, by using multiple indicators (confidence scores, correlations among cognitive structure variables, multiple recall/recognition measures, response latencies), future research could begin to isolate and examine in detail the precise mechanisms mediating thought measurement effects on cognitive structure.

# FOOTNOTES

<sup>1</sup>Our intent was to give subjects enough time to list their prior thoughts, but insufficient time to generate new thoughts via elaborative processing. Following Wright's (1980) suggestion, we observed naturally occurring pauses during the thought listing task for our pre-test subjects to determine an appropriate time limit.

<sup>2</sup>This procedure yielded 17 discriminable belief scores ( $b_{ij}$ ) for the seven salient attributes for bread, and 18 discriminable belief scores for the eight salient attributes for pen.

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TABLE 1

EFFECT OF THOUGHT MEASUREMENT AND PROCESSING GOALS FACTORS  
ON BRAND NAME RECALL FREQUENCY<sup>a</sup>

	Brand Evaluation Goal		Ad Evaluation Goal	
	Thought Measurement	No Thought Measurement	Thought Measurement	No Thought Measurement
<u>Brand Name Recall</u>				
Banner Bread	33	19	24	18
Sprint Pen	36	25	27	20

<sup>a</sup>Based on 40 subjects per cell.



TABLE 2

EFFECT OF THOUGHT MEASUREMENT ON CORRELATIONS  
BETWEEN BELIEFS AND ATTITUDE/INTENTION<sup>b</sup>

	Thought Measurement	No Thought Measurement
Correlation of the expectancy-value index ( $\sum \sum b_{ij} e_{ij}$ ) with -		
	<u>Product: White Bread</u>	
A <sub>br</sub>	.56	.42
A <sub>act</sub>	.57 <sup>a</sup>	.39 <sup>a</sup>
BI	.61 <sup>a</sup>	.43 <sup>a</sup>
	<u>Product: Ball Point Pen</u>	
A <sub>br</sub>	.59	.56
A <sub>act</sub>	.55	.53
BI	.62	.48

<sup>a</sup>These conditions (in a given row) differ at  $p < .10$ .

<sup>b</sup>The correlations are based on 80 observations.

TABLE 3

EFFECT OF THOUGHT MEASUREMENT AND PROCESSING GOALS FACTORS  
ON CORRELATIONS BETWEEN BELIEFS AND ATTITUDE/INTENTION<sup>a</sup>

	Brand Evaluation Goal		Ad Evaluation Goal	
	Thought Measurement	No Thought Measurement	Thought Measurement	No Thought Measurement
<u>Product: White Bread</u>				
Correlation of the expectancy-value index ( $\sum \sum b_{ij} e_{ij}$ ) with -				
A <sub>br</sub>	.72 <sup>b</sup>	.39 <sup>b</sup>	.31	.46
A <sub>act</sub>	.69 <sup>b</sup>	.37 <sup>b</sup>	.38	.40
BI	.76 <sup>b</sup>	.50 <sup>b</sup>	.38	.34
<u>Product: Ball Point Pen</u>				
A <sub>br</sub>	.67	.61	.51	.49
A <sub>act</sub>	.59	.58	.46	.47
BI	.69	.56	.55	.36

<sup>a</sup>These correlations are based on 40 observations.

<sup>b</sup>These correlations (in a given row) differ at  $p < .05$ .

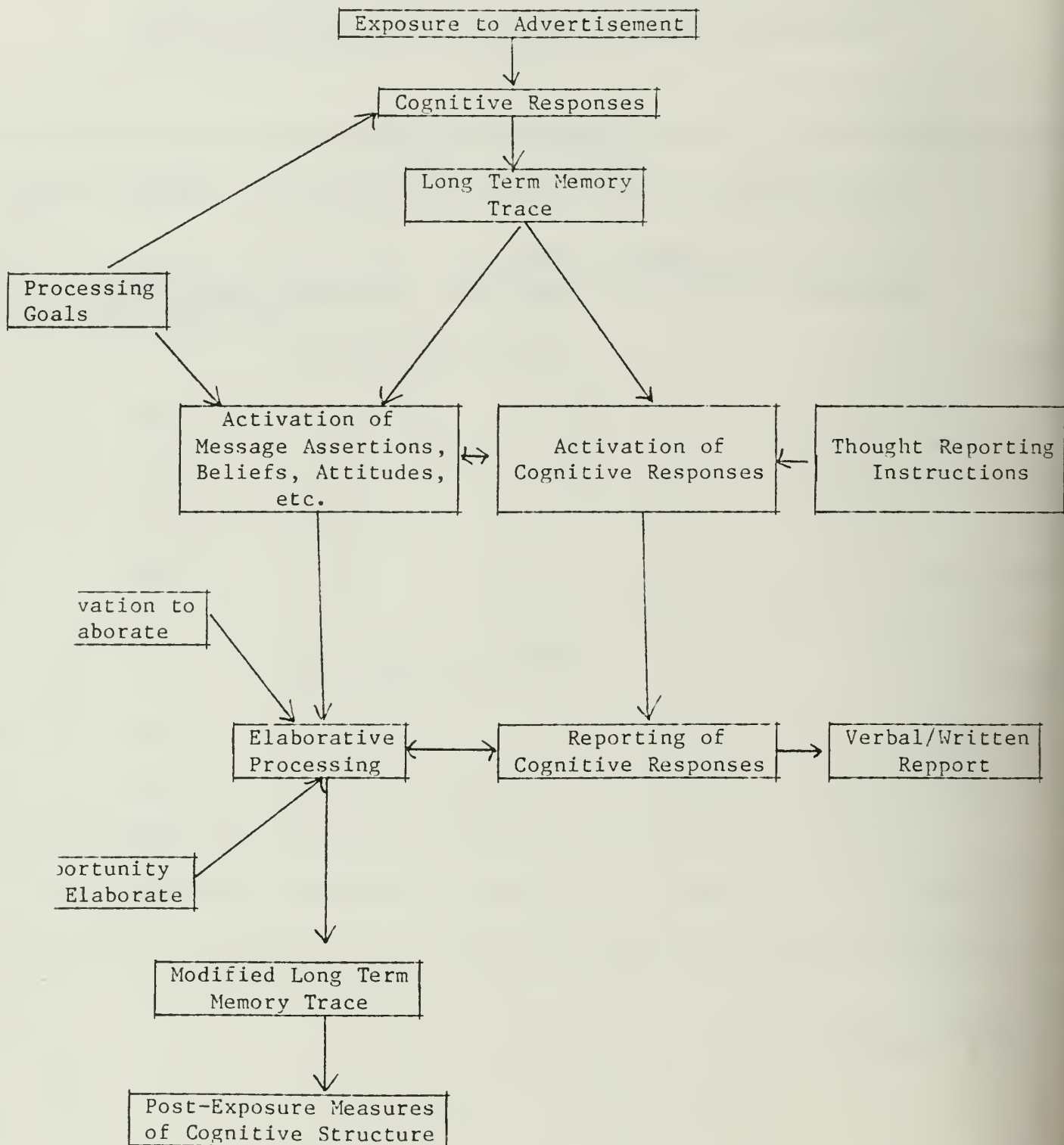
TABLE 4

EFFECTS OF THOUGHT MEASUREMENT AND PROCESSING GOALS FACTORS  
ON CONFIDENCE IN BELIEF, ATTITUDE, AND INTENTION VARIABLES

	Treatment Means				ANOVA - F-Ratio for:	
	Brand Evaluation Goal		Ad Evaluation Goal		Thought Measurement	Thought Measurement by Processing Goals
	Thought Measurement	No Thought Measurement	Thought Measurement	No Thought Measurement		
<u>Product: Banner Bread</u>						
Confidence:						
A <sub>br</sub>	5.45	5.10	5.28	4.95	2.75a	0.01
A <sub>act</sub>	5.68	5.08	5.50	5.18	5.74b	0.51
BI	6.10	5.73	5.83	5.45	5.17b	0.00
Beliefs (avg)	5.27	4.77	5.00	5.01	3.58a	3.58a
<u>Product: Sprint Pen</u>						
Confidence:						
A <sub>br</sub>	5.65	5.00	5.30	5.00	5.46b	0.74
A <sub>act</sub>	5.60	4.88	5.33	5.15	4.76b	1.78
BI	5.88	5.63	5.85	5.43	4.29b	0.29
Beliefs (avg)	5.30	4.60	5.08	4.93	10.71c	4.32b

FIGURE A

A MODEL OF THE RETROSPECTIVE THOUGHT LISTING/VERBALIZATION PROCESS







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